

2011-01-04 Substitute_Sequence_Listing
SEQUENCE LISTING

<110> Feldmann, Kenneth
Pennell, Roger
Kwok, Shing
Dang, Van-Dinh
Zhang, Hongyu

<120> NUCLEOTIDE SEQUENCES AND POLYPEPTIDES ENCODED THEREBY USEFUL FOR
INCREASING PLANT SIZE AND INCREASING THE NUMBER AND SIZE OF LEAVES

<130> 2750-1573PUS1

<140> 10/572,827
<141> 2006-03-21

<150> PCT/US03/25997
<151> 2003-08-18

<160> 50

<170> PatentIn version 3.0

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 <213> Zea mays subsp. mays

<220>
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 <222> (1)..(192)
 <223> ceres Seq. ID no. 12355478

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Gly Trp Thr Asp Glu Arg His Arg Leu Tyr Ile Ser Ser Met Glu Ala
35 40 45
Ser Phe Val Asp Gln Leu Tyr Asn His Gly Ser Arg Pro Arg Asn Ala
50 55 60
Asn Gly Thr Ala Phe Lys Ala Leu Arg Arg Glu Tyr Val Glu Tyr Glu
65 70 75 80
Lys Thr Asp Ala Pro Val Arg Arg Gly Ala Lys Cys Cys Gly Val Pro
85 90 95
Ala Asn Pro Trp Met Gln His Phe Arg Pro Arg Ser Asp Gly Lys Asn
100 105 110
Asn Ala Arg Gly Asp Gly Leu Gly Asp Ser Val Gly Asp Leu Glu Ser
115 120 125
Gly Thr Glu Ala Asn Arg Lys Ser Leu Ser Ala Ser His Gly Arg Glu
130 135 140
Arg Asp Ala Cys Glu Gly Glu Pro Gln Leu Leu His Glu Ser Arg Glu
145 150 155 160
Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala Glu Thr Glu
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<211> 163

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<213> Zea mays subsp. mays

<220>

<221> peptide

<222> (1)..(163)

<223> ceres Seq. ID no. 12355479

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Arg Asn Ala Asn Gly Thr Ala Phe Lys Ala Leu Arg Arg Glu Tyr Val
35 40 45

Glu Tyr Glu Lys Thr Asp Ala Pro Val Arg Arg Gly Ala Lys Cys Cys
50 55 60

Gly Val Pro Ala Asn Pro Trp Met Gln His Phe Arg Pro Arg Ser Asp
65 70 75 80

Gly Gly Asn Asn Ala Arg Gly Asp Gly Leu Gly Asp Ser Val Gly Asp
85 90 95

Leu Glu Ser Gly Thr Glu Ala Asn Arg Lys Ser Leu Ser Ala Ser His
100 105 110

Gly Arg Glu Arg Asp Ala Cys Glu Gly Glu Pro Gln Leu Leu His Glu
115 120 125

Ser Arg Glu Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala
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Glu Thr Glu Ser Met Lys Ala Tyr Lys Lys Arg Arg Leu Ser Arg Thr
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Met Ile Asn

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<211> 441

<212> DNA

<213> Zea mays subsp. mays

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ccacgtagtg atggcggtaa taacgcgcga ggcgatgggc tcggggattc tgtgggcgat 240

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2011-01-04 Substitute_Sequence_Listing 420
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 <213> Zea mays subsp. mays

<220>
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 <222> (1)..(147)
 <223> ceres Seq. ID no. 12355480

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 20 25 30
 Glu Tyr Glu Lys Thr Asp Ala Pro Val Arg Arg Gly Ala Lys Cys Cys
 35 40 45
 Gly Val Pro Ala Asn Pro Trp Met Gln His Phe Arg Pro Arg Ser Asp
 50 55 60
 Gly Gly Asn Asn Ala Arg Gly Asp Gly Leu Gly Asp Ser Val Gly Asp
 65 70 75 80
 Leu Glu Ser Gly Thr Glu Ala Asn Arg Lys Ser Leu Ser Ala Ser His
 85 90 95
 Gly Arg Glu Arg Asp Ala Cys Glu Gly Glu Pro Gln Leu Leu His Glu
 100 105 110
 Ser Arg Glu Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala
 115 120 125
 Glu Thr Glu Ser Met Lys Ala Tyr Lys Lys Arg Arg Leu Ser Arg Thr
 130 135 140
 Met Ile Asn
 145

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 <212> DNA
 <213> Zea mays subsp. mays

<220>
 <221> misc_feature
 <222> (1)..(1494)
 <223> ceres Seq. ID no. 12410516

<400> 8

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<211> 585

<212> DNA

<213> Zea mays subsp. mays

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tatataagct ccatggaggc ttcttttgtc gatcagctat acaacctagg aaacctccg 180

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gcctcagtgg gcgaccatga gtcgggtact caggcaagcc gcaagagccc ttcagtgtct	420
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 <213> Zea mays subsp. mays

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 <222> (1)..(195)
 <223> ceres Seq. ID no. 12410517

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 20 25 30
 Trp Thr Asp Glu Arg His Met Leu Tyr Ile Ser Ser Met Glu Ala Ser
 35 40 45
 Phe Val Asp Gln Leu Tyr Asn His Gly Asn His Pro His Asp Ala Asn
 50 55 60
 Gly Ala Gly Phe Lys Val Leu Arg Arg Gly Val Trp Glu Tyr Ile Glu
 65 70 75 80
 Tyr Glu Lys Thr Ser Ala Pro Val Arg Ser Gly Ala Lys Cys Cys Val
 85 90 95
 Pro Ala Asn Pro Trp Ile Arg His Phe Arg Pro Arg Asp Cys Gly Ser
 100 105 110
 Asn Ala Gln Ser Asp Ala Val Glu Ala Ser Val Gly Asp His Glu Ser
 115 120 125
 Gly Thr Gln Ala Ser Arg Lys Ser Pro Ser Val Ser His Gly Arg Glu
 130 135 140
 Arg Gly Ala Cys Lys Gly Glu Pro Gln Ile Leu His Glu Ser Thr Glu
 145 150 155 160
 Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu Ala Glu Thr Glu
 165 170 175
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185

190

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<210> 11
<211> 501
<212> DNA
<213> Zea mays subsp. mays

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<212> PRT
<213> Zea mays subsp. mays

<220>
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<223> ceres Seq. ID no. 12410518

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20 25 30
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35 40 45
Glu Tyr Ile Glu Tyr Glu Lys Thr Ser Ala Pro Val Arg Ser Gly Ala
50 55 60
Lys Cys Cys Val Pro Ala Asn Pro Trp Ile Arg His Phe Arg Pro Arg
65 70 75 80
Asp Cys Gly Ser Asn Ala Gln Ser Asp Ala Val Glu Ala Ser Val Gly
85 90 95
Asp His Glu Ser Gly Thr Gln Ala Ser Arg Lys Ser Pro Ser Val Ser
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105

110

His Gly Arg Glu Arg Gly Ala Cys Lys Gly Glu Pro Gln Ile Leu His
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Glu Ser Thr Glu Val Ser Asp Gln Asn Phe Ala Asp Asp Glu Ala Glu
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Ala Leu His Ser Gly Ala Glu
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<210> 13

<211> 471

<212> DNA

<213> Zea mays subsp. mays

<400> 13

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atcgagtagt agaagaccag tgcccctgtg cgaagtgggg cttaatgctg cgtccctgca 180

aatccttgga tccggcattt caggccacgt gactgcggtg gtaacgcaca gagtgcgcg 240

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gtgtctcatg gaagggaaac gggagcttgt aagggagaac ccagattct acatgaaagt 360

acagaggctc ctgatcaaaa ttttgctgac gatgaggctg aagctgaaac agaataatg 420

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<222> (1)..(157)

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20 25 30

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35 40 45

Pro Val Arg Ser Gly Ala Lys Cys Cys Val Pro Ala Asn Pro Trp Ile
50 55 60

Arg His Phe Arg Pro Arg Asp Cys Gly Ser Asn Ala Gln Ser Asp Ala
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<210> 17
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 <212> PRT
 <213> Brassica napus
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 <222> (1)..(92)
 <223> ceres Seq. ID no. 4788143

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 35 40 45
 Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn Ser Leu Gly
 50 55 60
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 65 70 75 80
 Phe Gly Asp Gly Gly Lys Pro Ser Glu Glu Gln Val
 85 90

<210> 18
 <211> 198
 <212> DNA
 <213> Brassica napus

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 <212> PRT
 <213> Brassica napus
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2011-01-04 Substitute_Sequence_Listing

20 25 30
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 50 55 60
 Gln Val
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 <212> DNA
 <213> Brassica napus

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 <213> Brassica napus

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 <223> ceres Seq. ID no. 4788145

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 35 40 45
 Gly Ser Val Met Val Glu Asn Leu Leu Lys Asn Arg Tyr Glu
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<210> 22
 <211> 486
 <212> DNA
 <213> Brassica napus

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 <221> misc_feature
 <222> (1)..(486)
 <223> ceres Seq. ID no. 4796909

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<400> 22
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 aacaacaagg atactgtcgg accatcgaga aggttcggtg atggtggaaa accttctgaa 360
 gaacagaaga tgaatgtgag gcagcctgag tatcgtctca atggaagaca cggtcgtcgc 420
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 acagat 486

<210> 23
 <211> 393
 <212> DNA
 <213> Brassica napus

<400> 23
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 gatgagaagc atagtgttga tcttaaatca atggaagctt cttctgttga tcagctgtac 180
 aactccctcg gtgcgctcgg ctccaaaaac aacaaggata ctgtcggacc atcgagaagg 240
 ttcggtgatg gtggaaaacc ttctgaagaa cagaagatga atgtgaggca gcctgagtat 300
 cgtctcaatg gaagacacgg tcgtcgtctc cacgagtttc ttaggagtc atggatcaag 360
 cactataagc cttcaccaaa gtccctaaca gat 393

<210> 24
 <211> 131
 <212> PRT
 <213> Brassica napus

<220>
 <221> peptide
 <222> (1)..(131)
 <223> ceres Seq. ID no. 4796910

<400> 24
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 1 5 10 15
 Ser Ser Val Gly Glu Glu Thr Thr Ser Ser Met Tyr Ser Ala Arg Asn
 20 25 30
 Glu Asp Thr Pro Thr Glu Trp Thr Asp Glu Lys His Ser Leu Tyr Leu
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35

40

45

Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn Ser Leu Gly
 50 55 60
 Ala Leu Gly Ser Lys Asn Lys Asp Thr Val Gly Pro Ser Arg Arg
 65 70 75 80
 Phe Gly Asp Gly Gly Lys Pro Ser Glu Glu Gln Lys Met Asn Val Arg
 85 90 95
 Gln Pro Glu Tyr Arg Leu Asn Gly Arg His Gly Arg Arg Ser His Glu
 100 105 110
 Phe Leu Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Ser Pro Lys Ser
 115 120 125
 Leu Thr Asp
 130

<210> 25
 <211> 315
 <212> DNA
 <213> Brassica napus

<400> 25
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 ccttctgaag aacagaagat gaatgtgagg cagcctgagt atcgctctca tgggaagacac 240
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 aagtccttaa cagat 315

<210> 26
 <211> 105
 <212> PRT
 <213> Brassica napus

<220>
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 <222> (1)..(105)
 <223> ceres Seq. ID no. 4796911

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 1 5 10 15
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 20 25 30
 Leu Tyr Asn Ser Leu Gly Ala Leu Gly Ser Lys Asn Asn Lys Asp Thr
 35 40 45
 Val Gly Pro Ser Arg Arg Phe Gly Asp Gly Gly Lys Pro Ser Glu Glu
 50 55 60

2011-01-04 Substitute_Sequence_Listing

Gln Lys Met Asn Val Arg Gln Pro Glu Tyr Arg Leu Asn Gly Arg His
65 70 75 80

Gly Arg Arg Ser His Glu Phe Leu Arg Ser Pro Trp Ile Lys His Tyr
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Lys Pro Ser Pro Lys Ser Leu Thr Asp
100 105

<210> 27
<211> 243
<212> DNA
<213> Brassica napus

<400> 27
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cagaagatga atgtgaggca gcctgagtat cgtctcaatg gaagacacgg tcgtcgctct 180
cacgagtttc ttaggagtc c atggatcaag cactataagc cttcaccaaa gtccttaaca 240
gat 243

<210> 28
<211> 81
<212> PRT
<213> Brassica napus

<220>
<221> peptide
<222> (1)..(81)
<223> ceres Seq. ID no. 4796912

<400> 28
Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn Ser Leu Gly Ala Leu
1 5 10 15
Gly Ser Lys Asn Asn Lys Asp Thr Val Gly Pro Ser Arg Arg Phe Gly
20 25 30
Asp Gly Gly Lys Pro Ser Glu Glu Gln Lys Met Asn Val Arg Gln Pro
35 40 45
Glu Tyr Arg Leu Asn Gly Arg His Gly Arg Arg Ser His Glu Phe Leu
50 55 60
Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Ser Pro Lys Ser Leu Thr
65 70 75 80
Asp

<210> 29

2011-01-04 Substitute_Sequence_Listing

<211> 1014

<212> DNA

<213> *Arabidopsis thaliana*

<220>

<221> misc_feature

<222> (1)..(1014)

<223> ceres Seq. ID no. 12321174

<400> 29

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tgattgcacg gtgaatatgt tctctctgga gaaggatcgc gatgtttcgg aggcgtcggc 180
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tgaaaattcc aacggaattt acaccatggg aactactgtc caaggagatg tgttatgtca 600
tgacgaaacc aaactctcag aggcgtcagg gcagaatttc agagaagaag aagaagaaga 660
agagaagggg gaggtgagca aaaaacgaga aagagaagca aataacgatg atagtccatt 720
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<210> 30

<211> 654

<212> DNA

<213> *Arabidopsis thaliana*

<400> 30

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gctgagacct ctggttctga tgctgattcc aaactggatg aatgtactgc ttggacgaat 180
gagaacaca actcatatct tgattattta gagagctcgt ttgttaggca attatactcc 240
ttgcttggag gtgggactca gagactttct agaactcgtg atgtgcagtc taactctcat 300
aatcagctg atcagtttac cgtcctacaa aatggttgct ggcagaagggt taactttgga 360

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2011-01-04 Substitute_Sequence_Listing

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ttatgtcatg acgaaaccaa aactcagag gcgtcagggc agaatttcag agaagaagaa	540
gaagaagaag agaagggaga ggtgagcaaa aaacgagaaa gagaagcaaa taacgatgat	600
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<210> 31
 <211> 218
 <212> PRT
 <213> Arabidopsis thaliana

<220>
 <221> peptide
 <222> (1)..(218)
 <223> ceres Seq. ID no. 12321175

<400> 31
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 20 25 30
 Asn Ser Leu Asp Ser Gly Val Thr Ala Glu Thr Ser Arg Ser Asp Ala
 35 40 45
 Asp Ser Lys Leu Asp Glu Cys Thr Ala Trp Thr Asn Glu Lys His Asn
 50 55 60
 Ser Tyr Leu Asp Tyr Leu Glu Ser Ser Phe Val Arg Gln Leu Tyr Ser
 65 70 75 80
 Leu Leu Gly Gly Gly Thr Gln Arg Leu Ser Arg Thr Arg Asp Val Gln
 85 90 95
 Ser Asn Ser His Lys Ser Ala Asp Gln Phe Thr Val Leu Gln Asn Gly
 100 105 110
 Cys Trp Gln Lys Val Asn Phe Gly Lys Lys Gln Ser Cys Leu Glu Thr
 115 120 125
 Ser Ser Glu Phe Arg Phe His Arg Asn Ser Leu Arg Asn Lys Pro Glu
 130 135 140
 Asn Ser Asn Gly Asn Tyr Thr Met Gly Thr Thr Val Gln Gly Asp Val
 145 150 155 160
 Leu Cys His Asp Glu Thr Lys His Ser Glu Ala Ser Gly Gln Asn Phe
 165 170 175
 Arg Glu Glu Glu Glu Glu Glu Lys Gly Glu Val Ser Lys Lys Arg
 180 185 190
 Glu Arg Glu Ala Asn Asn Asp Asp Ser Ser Leu Lys Glu Asp Gln Val
 195 200 205

2011-01-04 Substitute_Sequence_Listing

Val Pro Val Arg Met Val Lys Pro Arg Thr
210 215

<210> 32
<211> 1027
<212> DNA
<213> Arabidopsis thaliana

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<222> (1)..(1027)
<223> ceres Seq. ID no. 12323601

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agaggtatcg gatcagaact ttgttaacga aggaataaaa ggcgaaaacg gaagctcgaa 720
gaagatgaag acggtgatga tgagtgaatc gtcgagtacc gatcaggttg ttccactcaa 780
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tactatcctt agttacaagt ttcttcatca tatatcccta actataaata tatttatatg 960
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gatggtc 1027

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<210> 33
<211> 819
<212> DNA
<213> Arabidopsis thaliana

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<400> 33
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2011-01-04 Substitute_Sequence_Listing

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agtttatatc ttaaatctat ggaagcttca ttcgtagatc agttatataa ctcgctcgga	300
gctctcggga agaacgagaa tgatccgaa tcaacgaggt tcggtagcgg tagaaaaaccg	360
tctcaagaac agttcaaggt tcttcatgat ggtttctggc agaagattaa tgtgaaacaa	420
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tggattaacg attataaac ttagtaaaag acacaaatcc cggtaacgga tgagcccgaa	540
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agtctcaagc agctaagctc tcattcgcgt gaccacgacc aaatcagcgt tggagaagca	660
gaggtatcgg atcagaactt tgtaaagaa ggaataaaag gcgaaaacgg aagctcgaag	720
aagatgaaga cggatgatgat gagtgaatcg tcgagtaccg atcagggtgt tccactcaat	780
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<210> 34

<211> 273

<212> PRT

<213> Arabidopsis thaliana

<220>

<221> peptide

<222> (1)..(273)

<223> ceres Seq. ID no. 12323602

<400> 34

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Phe Ser Leu Ser Leu His Lys Asp Lys Pro Thr Met Val Gly Asp Tyr
20 25 30

Arg Gly Arg Phe Ser Ser Arg Arg Phe Ser Asp Asp Ser Asp Asp Ser
35 40 45

Ser Asp Asp Ala Ser Ser Val Glu Gly Glu Thr Thr Ser Ser Met Tyr
50 55 60

Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp Thr Asn Glu Lys His
65 70 75 80

Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr
85 90 95

Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu Ser Thr
100 105 110

Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu Gln Phe Lys Val Leu
115 120 125

His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys Gln Pro Glu His Arg
130 135 140

2011-01-04 Substitute_Sequence_Listing

Ile Asn Gly Arg His Gly Gly Asn Ser His Glu Phe Leu Arg Ser Pro
145 150 155 160
Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr Gln Ile Pro Val Thr
165 170 175
Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser Asn Gly Lys Lys Gly
180 185 190
Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys Gln Leu Ser Ser His
195 200 205
Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu Ala Glu Val Ser Asp
210 215 220
Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu Asn Gly Ser Ser Lys
225 230 235 240
Lys Met Lys Thr Val Met Met Ser Glu Ser Ser Thr Asp Gln Val
245 250 255
Val Pro Leu Asn Lys Leu Leu Gln His Asp Val Asn Leu Lys Ser Val
260 265 270

Ser

<210> 35
<211> 738
<212> DNA
<213> Arabidopsis thaliana

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gttaacgaag gaataaaagg cgaacacgga agctcgaaga agatgaagac ggtgatgatg 660
agtgaatcgt cgagtaccga tcagggtggt ccactcaata agctcttgca acatgacgta 720
aatttgaagt ctgtttct 738

<210> 36
<211> 246
<212> PRT
<213> Arabidopsis thaliana

2011-01-04 Substitute_Sequence_Listing

<220>
 <221> peptide
 <222> (1)..(246)
 <223> ceres Seq. ID no. 12323603

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 20 25 30
 Thr Ser Ser Met Tyr Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp
 35 40 45
 Thr Asn Glu Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe
 50 55 60
 Val Asp Gln Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn
 65 70 75
 Val Ser Glu Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu
 85 90 95
 Gln Phe Lys Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys
 100 105 110
 Gln Pro Glu His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu
 115 120 125
 Phe Leu Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr
 130 135 140
 Gln Ile Pro Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser
 145 150 155 160
 Asn Gly Lys Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys
 165 170 175
 Gln Leu Ser Ser His Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu
 180 185 190
 Ala Glu Val Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu
 195 200 205
 Asn Gly Ser Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser
 210 215 220
 Ser Thr Asp Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val
 225 230 235 240
 Asn Leu Lys Ser Val Ser
 245

<210> 37
 <211> 633
 <212> DNA
 <213> Arabidopsis thaliana

<400> 37

2011-01-04 Substitute_Sequence_Listing

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catcggatta acggaaggca cggtggtaat tctcatgagt ttcttaggag tccatggatt	300
aagcattata aacctttagt aaagacacaa atcccggtaa cggatgagcc cgaaaatcaa	360
gttgtagca gctctaattg gaagaaggga atatgcagct ctggctcagc ctctagtctc	420
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aagacggtga tgatgagtga atcgtcagat accgatcagg ttgtccact caataagctc	600
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<210> 38

<211> 211

<212> PRT

<213> Arabidopsis thaliana

<220>

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<222> (1)..(211)

<223> ceres Seq. ID no. 12323604

<400> 38

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Leu	Tyr	Asn	Ser	Leu	Gly	Ala	Leu	Gly	Lys	Asn	Glu	Asn	Val	Ser	Glu
		35					40					45			

Ser	Thr	Arg	Phe	Gly	Ser	Gly	Arg	Lys	Pro	Ser	Gln	Glu	Gln	Phe	Lys
		50				55					60				

Val	Leu	His	Asp	Gly	Phe	Trp	Gln	Lys	Ile	Asn	Val	Lys	Gln	Pro	Glu
65				70						75				80	

His	Arg	Ile	Asn	Gly	Arg	His	Gly	Gly	Asn	Ser	His	Glu	Phe	Leu	Arg
			85						90					95	

Ser	Pro	Trp	Ile	Lys	His	Tyr	Lys	Pro	Leu	Val	Lys	Thr	Gln	Ile	Pro
			100					105						110	

Val	Thr	Asp	Glu	Pro	Glu	Asn	Gln	Val	Val	Ser	Ser	Ser	Asn	Gly	Lys
		115					120					125			

Lys	Gly	Ile	Cys	Ser	Ser	Gly	Ser	Ala	Ser	Ser	Leu	Lys	Gln	Leu	Ser
		130				135					140				

Ser	His	Ser	Arg	Asp	His	Asp	Gln	Ile	Ser	Val	Gly	Glu	Ala	Glu	Val
145					150					155					160

2011-01-04 Substitute_Sequence_Listing

Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu Asn Gly Ser
165 170 175

Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser Ser Thr Asp
180 185 190

Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val Asn Leu Lys
195 200 205

Ser val Ser
210

<210> 39
<211> 960
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> misc_feature
<222> (1)..(960)
<223> ceres Seq. ID no. 13491409

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tttatatctt aaatctatgg aagcttcatt cgtagatcag ttatataact cgctcggagc 300
tctcgggaag aacgagaatg tatccgaatc aacgaggttc ggtagcggta gaaaaccgtc 360
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tcaagttggt agcagctcta atgggaagaa gggaatatgc agctctggct cagcctctag 600
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gatgaagacg gtgatgatga gtgaatcgtc gagtaccgat caggtgttct cactcaataa 780
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<211> 816
<212> DNA
<213> Arabidopsis thaliana

2011-01-04 Substitute_Sequence_Listing

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 caagaacagt tcaaggttct tcatgatggt ttctggcaga agattaatgt gaaacaacct 420
 gaacatcgga ttaacggaag gcacggtggt aattctcatg agtttcttag gagtccatgg 480
 attaagcatt ataaaccttt agtaaagaca caaatcccgg taacggatga gcccgaaaat 540
 caagttgtta gcagctctaa tgggaagaag ggaatatgca gctctggctc agcctctagt 600
 ctcaagcagc taagctctca ttcgctgac cagacacaaa tcagcgttgg agaagcagag 660
 gtatcgatc agaactttgt taacgaagga ataaaagcg aaaacggaag ctcgagaag 720
 atgaagcgg tgatgatgag tgaatcgtc agtaccgatc aggttggtcc actcaataaa 780
 ctcttgcaac atgacgtaaa ttgaagtct gtttct 816

<210> 41
 <211> 272
 <212> PRT
 <213> Arabidopsis thaliana
 <220>
 <221> peptide
 <222> (1)..(272)
 <223> ceres Seq. ID no. 13491410

<400> 41
 Phe Leu Phe Leu Ser Phe Ser Leu Ile Phe Phe Ile Phe Phe Phe 1 5 10 15
 Ser Leu Ser Leu His Lys Asp Lys Pro Thr Met Val Gly Asp Tyr Arg 20 25 30
 Gly Arg Phe Ser Ser Arg Arg Phe Ser Asp Asp Ser Asp Ser Ser 35 40 45
 Asp Asp Ala Ser Ser Val Glu Gly Glu Thr Thr Ser Ser Met Tyr Ser 50 55 60
 Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp Thr Asn Glu Lys His Ser 65 70 75 80
 Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln Leu Tyr Asn 85 90 95
 Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu Ser Thr Arg

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Phe	Gly	Ser ₁₁₅	Gly	Arg	Lys	Pro	Ser ₁₂₀	Gln	Glu	Gln	Phe	Lys ₁₂₅	Val	Leu	His
Asp	Gly ₁₃₀	Phe	Trp	Gln	Lys	Ile ₁₃₅	Asn	Val	Lys	Gln	Pro ₁₄₀	Glu	His	Arg	Ile
Asn	Gly	Arg	His	Gly	Gly ₁₅₀	Asn	Ser	His	Glu	Phe ₁₅₅	Leu	Arg	Ser	Pro	Trp ₁₆₀
Ile	Lys	His	Tyr	Lys ₁₆₅	Pro	Leu	Val	Lys	Thr ₁₇₀	Gln	Ile	Pro	Val	Thr ₁₇₅	Asp
Glu	Pro	Glu	Asn ₁₈₀	Gln	Val	Val	Ser	Ser ₁₈₅	Ser	Asn	Gly	Lys	Lys ₁₉₀	Gly	Ile
Cys	Ser	Ser ₁₉₅	Gly	Ser	Ala	Ser	Ser ₂₀₀	Leu	Lys	Gln	Leu	Ser ₂₀₅	Ser	His	Ser
Arg	Asp ₂₁₀	His	Asp	Gln	Ile	Ser ₂₁₅	Val	Gly	Glu	Ala	Glu ₂₂₀	Val	Ser	Asp	Gln
Asn	Phe	Val	Asn	Glu	Gly ₂₃₀	Ile	Lys	Gly	Glu	Asn ₂₃₅	Gly	Ser	Ser	Lys	Lys ₂₄₀
Met	Lys	Thr	Val	Met ₂₄₅	Met	Ser	Glu	Ser	Ser ₂₅₀	Ser	Thr	Asp	Gln	Val ₂₅₅	Val
Pro	Leu	Asn	Lys ₂₆₀	Leu	Leu	Gln	His	Asp ₂₆₅	Val	Asn	Leu	Lys	Ser ₂₇₀	Val	Ser

<40>	42
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tcttcgcacg atgctttctt cgtggaggga gagaccactt cttccatgta ctctgcgggg	120
aaagagtata tggaaacaga atggactaat gagaagcata gtatatatct taaatctatg	180
gaagcttcac tcgtagatca gttatataac tcgctcgag ctctcgggaa gaacgagaat	240
gtatccgaat caacgaggtt cggtagcggg agaaaaccgt ctcaagaaca gttcaagggt	300
cttcatgatg gtttctggca gaagattaat gtgaacaac ctgaacatcg gattaacgga	360
aggcacgggt gtaattctca tgagtttctt aggagtccat ggattaagca ttataaacct	420
ttagtaaaga cacaaatccc ggtaacggat gagccccgaa atcaagttgt tagcagctct	480
aattgggaaga agggaatatg aagctctggc tcagcctcta gtctcaaaga gctaagctct	540
cattcgcgtg accacagacca cactcagcgt ggagaagcag aggatctgga tcagaacctt	600
gttaacgaag gaataaaagg cgaaaacgga agctcgaaga aggatgaagc ggtgatgatg	660
aqtgaatcqt cqagtaccqa tcaggttgtt ccactcaata aactcttgca acatqacqta	720

aatttgaagt ctgtttct

738

<210> 43
 <211> 246
 <212> PRT
 <213> Arabidopsis thaliana
 <220>
 <221> peptide
 <222> (1)..(246)
 <223> ceres Seq. ID no. 13491411

<400> 43
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 Asp Ser Asp Asp Ser Ser Asp Asp Ala Ser Ser Val Glu Gly Glu Thr
 20 25 30
 Thr Ser Ser Met Tyr Ser Ala Gly Lys Glu Tyr Met Glu Thr Glu Trp
 35 40 45
 Thr Asn Glu Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe
 50 55 60
 Val Asp Gln Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn
 65 70 75 80
 Val Ser Glu Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu
 85 90 95
 Gln Phe Lys Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys
 100 105 110
 Gln Pro Glu His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu
 115 120 125
 Phe Leu Arg Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr
 130 135 140
 Gln Ile Pro Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser
 145 150 155 160
 Asn Gly Lys Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys
 165 170 175
 Gln Leu Ser Ser His Ser Arg Asp His Asp Gln Ile Ser Val Glu Gly
 180 185 190
 Ala Glu Val Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu
 195 200 205
 Asn Gly Ser Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser
 210 215 220
 Ser Thr Asp Gln Val Val Pro Leu Asn Lys Leu Gln His Asp Val
 225 230 235 240
 Asn Leu Lys Ser Val Ser
 245

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<210> 44
 <211> 633
 <212> DNA
 <213> *Arabidopsis thaliana*

<400> 44
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 tatcttaaat ctatggaagc ttcatctgta gatcagttat ataactcgct cggagctctc 120
 gggaagaacg agaatgtatc cgaatcaacg aggttcgcta gcggtagaaa accgtctcaa 180
 gaacagtta aggttcttta tgatggtttc tggcagaaga ttaatgtgaa acaacctgaa 240
 catcggatta acggaaggca cggtggtaat tctcatgagt ttcttaggag tccatggatt 300
 aagcattata aacctttagt aaagacacaa atcccggtaa cggatgagcc cgaaaaatcaa 360
 gttgttagca gctctaattg gaagaaggga atatgcagct ctggctcagc ctctagtctc 420
 aagcagctaa gctctcattc gcgtgaccac gaccaaata gcgttggaaga agcagaggta 480
 tcggatcaga actttgttaa cgaagggaata aaaggcgaaa acggaagctc gaagaagatg 540
 aagacggtga tgatgagta atcgtcagat accgatcagg ttgttcact caataaactc 600
 ttgcaacatg acgtaaattt gaagtctgtt tct 633

<210> 45
 <211> 211
 <212> PRT
 <213> *Arabidopsis thaliana*

<220>
 <221> peptide
 <222> (1)..(211)
 <223> ceres Seq. ID no. 13491412

<400> 45
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 Lys His Ser Leu Tyr Leu Lys Ser Met Glu Ala Ser Phe Val Asp Gln
 20 25 30
 Leu Tyr Asn Ser Leu Gly Ala Leu Gly Lys Asn Glu Asn Val Ser Glu
 35 40 45
 Ser Thr Arg Phe Gly Ser Gly Arg Lys Pro Ser Gln Glu Gln Phe Lys
 50 55 60
 Val Leu His Asp Gly Phe Trp Gln Lys Ile Asn Val Lys Gln Pro Glu
 65 70 75 80
 His Arg Ile Asn Gly Arg His Gly Gly Asn Ser His Glu Phe Leu Arg
 85 90 95
 Ser Pro Trp Ile Lys His Tyr Lys Pro Leu Val Lys Thr Gln Ile Pro
 100 105 110
 Val Thr Asp Glu Pro Glu Asn Gln Val Val Ser Ser Ser Asn Gly Lys
 115 120 125

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Lys Gly Ile Cys Ser Ser Gly Ser Ala Ser Ser Leu Lys Gln Leu Ser
 130 135 140
 Ser His Ser Arg Asp His Asp Gln Ile Ser Val Gly Glu Ala Glu Val
 145 150 155 160
 Ser Asp Gln Asn Phe Val Asn Glu Gly Ile Lys Gly Glu Asn Gly Ser
 165 170 175
 Ser Lys Lys Met Lys Thr Val Met Met Ser Glu Ser Ser Ser Thr Asp
 180 185 190
 Gln Val Val Pro Leu Asn Lys Leu Leu Gln His Asp Val Asn Leu Lys
 195 200 205
 Ser Val Ser
 210

<210> 46
 <211> 1031
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> clone nucleotide 486033

<220>
 <221> misc_feature
 <222> (609)..(609)
 <223> n is a, c, g, or t

<400> 46
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 tgttgagatt cagtttgcatt cctgagctct ctctgggacc agccgagatt tctctctctg 120
 cgcatctcta attcatcttc gtcgagagga gctgttcctc ttctttgccg cctcgaatct 180
 gggactggct ggttttctcg atccctgctg cctgtcgggt tctcgagagg tgtaaaatcc 240
 aatggagggt gtgtcatcgt tgaaccagcc gttgatcaac gacgaccggc agcccggtgc 300
 cagcagtatc gccaaagggt atcaaatcca aggcctgttg tcgggtgaat ggacaaatga 360
 gcggcacagc tcgtacataa gctccatgga ggcattcttc gtggagcaac tccgtagtgg 420
 ttccaaggcc atccaggagg gcttgtgcca gagcatgagg attccgaggg atgatgctcg 480
 cagccatgac gtccttgaga gtccgtgggt ggtggtgagg cgttcaggc cagcggtgt 540
 ccaccatggc gatggaatgg aagtggaaac ttggtcgat ggttatggat caggtactga 600
 cagggccng agagaaggct cggaccacg caagatagcg aaggcttctg ctattattga 660
 agtcacggac cagaattttc ctgaggaggg gattcaatcc agtaacggtg catgcaagag 720
 acagaaatct actcctggca atgcatcaaa tggccagggt acttaacaag atagtgaag 780

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ccaagccatg ccctctctga agccttcagg aggccatggg ggaaacgaga ctgtctgca      840
gtactacgtg atgacaggtc gtgctgcagc tgcaagtagt ttggcttacc aaaatatgat      900
atcgtcgtcc tttctcgggt gtggagagta gaatatgcat atccacatct gcagagagca      960
ccggttctct tcttcttggt gctgttacta ttttgtgcca tggagcaaat ttatttgga      1020
aatttgagct g                                     1031

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<210> 47
<211> 174
<212> PRT
<213> Artificial Sequence

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<220>
<223> clone peptide 486033

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<220>
<221> misc_feature
<222> (123)..(123)
<223> Xaa can be any naturally occurring amino acid

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<400> 47

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Met Glu Gly Val Ser Ser Leu Asn Gln Pro Leu Ile Asn Asp Asp Arg
1          5          10          15

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Gln Pro Val Pro Ser Ser Ile Ala Lys Gly Asp Gln Ile Gln Gly Leu
20          25          30

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```

Leu Ser Gly Glu Trp Thr Asn Glu Arg His Ser Ser Tyr Ile Ser Ser
35          40          45

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Met Glu Ala Ser Phe Val Glu Gln Leu Arg Ser Gly Ser Lys Ala Ile
50          55          60

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Gln Glu Gly Leu Cys Gln Ser Met Arg Ile Pro Arg Asp Asp Ala Arg
65          70          75          80

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Ser His Asp Val Pro Glu Ser Pro Trp Val Val Val Arg Arg Phe Arg
85          90          95

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Pro Arg Gly Val His His Gly Asp Gly Met Glu Val Glu Pro Leu Val
100         105         110

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```

Asp Gly Tyr Gly Ser Gly Thr Asp Thr Ala Xaa Arg Glu Gly Pro Asp
115         120         125

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Pro Arg Lys Ile Ala Lys Ala Ser Ala Ile Ile Glu Val Thr Asp Gln
130         135         140

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Asn Phe Pro Glu Glu Gly Ile Gln Ser Ser Asn Gly Ala Cys Lys Arg
 145 150 155 160

Gln Lys Ser Thr Pro Gly Asn Ala Ser Asn Gly Gln Gly Thr
 165 170

<210> 48

<211> 210

<212> PRT

<213> Artificial Sequence

<220>

<223> Consensus sequence derived from various organisms

<220>

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<222> (2)..(2)

<223> Xaa is Glu or Lys

<220>

<221> misc_feature

<222> (3)..(3)

<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>

<221> misc_feature

<222> (5)..(5)

<223> Xaa is Thr or Pro

<220>

<221> misc_feature

<222> (7)..(8)

<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>

<221> misc_feature

<222> (9)..(9)

<223> Xaa is Met or Gly

<220>

<221> misc_feature

<222> (10)..(10)

<223> Xaa is Tyr or Ile

<220>

<221> misc_feature

<222> (11)..(11)

<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>

<221> misc_feature

<222> (12)..(12)

<223> Xaa is Ala or Lys

<220>

<221> misc_feature

<222> (14)..(14)

2011-01-04 Substitute_Sequence_Listing

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<223> Xaa is Lys or Asn

<220>
<221> misc_feature
<222> (15)..(15)
<223> Xaa is Glu or Arg

<220>
<221> misc_feature
<222> (16)..(16)
<223> Xaa is Tyr or Val

<220>
<221> misc_feature
<222> (17)..(17)
<223> xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>
<221> misc_feature
<222> (18)..(18)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (19)..(19)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
<221> misc_feature
<222> (20)..(23)
<223> At least 1 but as many as 4 of the Xaa amino acids can be present;
Xaa is any amino acid

<220>
<221> misc_feature
<222> (26)..(26)
<223> Xaa is Asn or Asp

<220>
<221> misc_feature
<222> (28)..(28)
<223> Xaa is a positively charged residue, specifically, lysine, arginine,
or histidine

<220>
<221> misc_feature
<222> (30)..(30)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (31)..(31)
<223> Xaa is Leu or Ser

<220>
<221> misc_feature
<222> (33)..(33)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>

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2011-01-04 Substitute_Sequence_Listing

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<221> misc_feature
<222> (34)..(34)
<223> Xaa is Lys or Ser

<220>
<221> misc_feature
<222> (42)..(42)
<223> xaa is any negatively charged amino acid, specifically,
      aspartic acid or glutamic acid

<220>
<221> misc_feature
<222> (45)..(74)
<223> Any one or all of the xaa amino acids can either be present or
      absent; xaa is any amino acid

<220>
<221> misc_feature
<222> (76)..(76)
<223> xaa is Val or Ala

<220>
<221> misc_feature
<222> (77)..(77)
<223> xaa is an aliphatic residue, specifically, isoleucine, valine,
      leucine, or methionine

<220>
<221> misc_feature
<222> (78)..(79)
<223> xaa is any amino acid

<220>
<221> misc_feature
<222> (80)..(80)
<223> xaa is Gly or Glu

<220>
<221> misc_feature
<222> (81)..(82)
<223> xaa is any amino acid

<220>
<221> misc_feature
<222> (83)..(83)
<223> xaa is Gln or Glu

<220>
<221> misc_feature
<222> (84)..(102)
<223> At least 9 but as many as 19 of the xaa amino acids can be
      present; xaa is any amino acid

<220>
<221> misc_feature
<222> (103)..(103)
<223> xaa is His or Cys

<220>
<221> misc_feature
<222> (104)..(104)
<223> xaa is any amino acid

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<220>
<221> misc_feature
<222> (105)..(105)
<223> Xaa is Phe or Val

<220>
<221> misc_feature
<222> (106)..(106)
<223> Xaa is Leu or Pro

<220>
<221> misc_feature
<222> (107)..(107)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (108)..(108)
<223> Xaa is Ser or Asn

<220>
<221> misc_feature
<222> (111)..(112)
<223> Any one or ll of the xaa amino acids can either be present or
absent; Xaa is any amino acid

<220>
<221> misc_feature
<222> (113)..(113)
<223> xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>
<221> misc_feature
<222> (114)..(114)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (115)..(115)
<223> xaa is a positively charged residue, specifically, lysine,
arginine, or histidine

<220>
<221> misc_feature
<222> (116)..(116)
<223> xaa is any aromatic residue, specifically, phenylalanine,
tyrosine, or tryptophan

<220>
<221> misc_feature
<222> (117)..(117)
<223> xaa is a positively charged residue, specifically, lysine,
arginine, or histidine

<220>
<221> misc_feature
<222> (119)..(126)
<223> Any one or all of the Xaa amino acids can either be present
or absent; Xaa is any amino acid

<220>
<221> misc_feature

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2011-01-04 Substitute_Sequence_Listing

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<222> (127)..(127)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
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<222> (129)..(130)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (131)..(131)
<223> Xaa is Glu or Asn

<220>
<221> misc_feature
<222> (132)..(139)
<223> Xaa is any amino acid

<220>
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<222> (140)..(140)
<223> Xaa is Gly

<220>
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<222> (141)..(146)
<223> Any one or all of the Xaa amino acids can either be present
or absent; Xaa is any amino acid

<220>
<221> misc_feature
<222> (148)..(148)
<223> Xaa is Gly or Pro

<220>
<221> misc_feature
<222> (149)..(149)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
<221> misc_feature
<222> (150)..(150)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (151)..(151)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
<221> misc_feature
<222> (152)..(153)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (154)..(154)
<223> Xaa is a positively charged residue, specifically, lysine,
arginine, or histidine

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2011-01-04 Substitute_Sequence_Listing

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<220>
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<222> (155)..(171)
<223> At least 6 but as many as 17 of the Xaa amino acids can be
      present; Xaa is any amino acid

<220>
<221> misc_feature
<222> (172)..(172)
<223> Xaa is Gln or Lys

<220>
<221> misc_feature
<222> (173)..(173)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
      leucine, or methionine

<220>
<221> misc_feature
<222> (174)..(176)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (177)..(177)
<223> Xaa is Glu or Ser

<220>
<221> misc_feature
<222> (178)..(180)
<223> At least 1 but as many as 3 of the Xaa amino acids can be
      present; Xaa is any amino acid

<220>
<221> misc_feature
<222> (183)..(183)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
      serine or threonine

<220>
<221> misc_feature
<222> (188)..(189)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (190)..(190)
<223> Xaa is any negatively charged amino acid, specifically,
      aspartic acid or glutamic acid

<220>
<221> misc_feature
<222> (191)..(191)
<223> Xaa is Gly or Glu

<220>
<221> misc_feature
<222> (192)..(192)
<223> Xaa is Ile or Ala

<220>
<221> misc_feature
<222> (193)..(193)

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<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (194)..(194)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
<221> misc_feature
<222> (195)..(195)
<223> Xaa is Glu or Ser

<220>
<221> misc_feature
<222> (196)..(196)
<223> Xaa is Asn or Thr

<220>
<221> misc_feature
<222> (197)..(197)
<223> Xaa is Gly or Glu

<220>
<221> misc_feature
<222> (198)..(198)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine,
serine or threonine

<220>
<221> misc_feature
<222> (199)..(199)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (201)..(202)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (204)..(204)
<223> Xaa is any amino acid

<220>
<221> misc_feature
<222> (205)..(205)
<223> Xaa is Val or Arg

<220>
<221> misc_feature
<222> (206)..(206)
<223> Xaa is Met or Arg

<220>
<221> misc_feature
<222> (207)..(207)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>
<221> misc_feature
<222> (209)..(209)

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<223> Xaa is Glu or Arg

<220>

<221> misc_feature

<222> (210)..(210)

<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<400> 48

Val Xaa Xaa Glu Xaa Thr Xaa Xaa Xaa Xaa Xaa Gly Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Trp Thr Xaa Glu Xaa His Xaa Xaa Tyr
20 25 30

Xaa Xaa Ser Met Glu Ala Ser Phe Val Xaa Gln Leu Xaa Xaa Xaa Xaa
35 40 45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
50 55 60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
65 70 75 80

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
85 90 95

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro Trp Xaa Xaa
100 105 110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp
115 120 125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
130 135 140

Xaa Xaa Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
145 150 155 160

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
165 170 175

Xaa Xaa Xaa Xaa Glu Val Xaa Asp Gln Asn Phe Xaa Xaa Xaa Xaa Xaa
180 185 190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ser
195 200 205

Xaa Xaa

210

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<223> Consensus sequence derived from various organisms

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<220>
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<222> (2)..(2)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

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<222> (3)..(10)
<223> Xaa is any amino acid

<220>
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<222> (11)..(11)
<223> Xaa is Glu or Gly

<220>
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<222> (12)..(16)
<223> At least 2 but as many as 5 of the Xaa amino acids can be present;
Xaa is any amino acid

<220>
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<222> (17)..(17)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine or threonine

<220>
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<222> (18)..(31)
<223> At least 11 but as many as 14 of the Xaa amino acids can be present;
Xaa is any amino acid

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<221> misc_feature
<222> (34)..(34)
<223> Xaa is Asn or Asp

<220>
<221> misc_feature
<222> (36)..(36)
<223> Xaa is a positively charged residue, specifically, lysine, arginine,
or histidine

<220>
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<222> (38)..(39)
<223> Xaa is any amino acid

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<220>
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<222> (41)..(41)
<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

<220>
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<222> (42)..(42)
<223> Xaa is any amino acid

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<222> (43)..(43)
<223> Xaa is Ser or Tyr

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<223> Xaa is an aliphatic residue, specifically, isoleucine, valine,
leucine, or methionine

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<222> (46)..(46)
<223> Xaa is a tiny amino acid, specifically, alanine, glycine, serine
or threonine

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<223> Xaa is any amino acid

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<222> (52)..(52)
<223> Xaa is Lys or Ser

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<222> (53)..(135)
<223> At least 8 but as many as 83 of the Xaa amino acids can be present;
Xaa is any amino acid

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<223> Xaa is Pro or Glu

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<222> (137)..(137)
<223> Xaa is any aromatic residue, specifically, phenylalanine, tyrosine,
and tryptophan

<220>
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<222> (138)..(141)
<223> At least 2 but as many as 4 of the Xaa amino acids can be present;
Xaa is any amino acid

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<222> (142)..(142)
 <223> Xaa is a positively charged residue, specifically, lysine, arginine, or histidine

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 <222> (143)..(231)
 <223> At least 9 but as many as 89 of the Xaa amino acids can be present; Xaa is any amino acid

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 <222> (233)..(234)
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 <222> (235)..(235)
 <223> Xaa is Asp or Gly

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 <222> (239)..(240)
 <223> Xaa is any amino acid

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 <222> (241)..(241)
 <223> Xaa is any negatively charged amino acid, specifically, aspartic acid or glutamic acid

<400> 49

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Trp
 20 25 30

Thr Xaa Glu Xaa His Xaa Xaa Tyr Xaa Xaa Xaa Xaa Glu Xaa Ser Phe
 35 40 45

Val Xaa Gln Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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180 185 190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
195 200 205

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa

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<220>
<223> Oligo primer used in the generation of labeled probes for hybridization from first-strand cDNA

<400> 50
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19